THE BOULDER BEHAVIORIST

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# A COMPARISON OF MODELING VERSUS NO MODELING IN A STAFF TRAINING EXERCISE

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Staff Development Department

Modeling is the teaching technique whereby the trainer gives a demonstration of a task to the student before the student is required to perform it. Used by itself, modeling has been shown to be an effective method for teaching parents to train emotionally and developmentally disabled children (Johnson & Brown, 1969; Deitz & Hoekinga, 1974) and has been used to establish functional speech in psychotic and echolalic children (Lovaas, 1968; Risley & Wolf, 1968).

Combined with other techniques, such as rehearsal procedures, shaping, prompting, and fading, modeling can be used to teach assertiveness (Eisler, Hersen, & Miller, 1973), to train institutionalized developmentally disabled clients (Azrin & Foxx, 1971), to train parents to teach chewing behaviors to their developmentally disabled child (Butterfield & Parson, 1973), and to teach appropriate mealtime behaviors to institutionalized developmentally disabled clients (O'Brien & Azrin, 1972).

The Boulder Training Center is a demonstration classroom located at an intensive care facility for mentally retarded persons. The purpose of the classroom is to teach direct-care staff how to train residents in both formal and informal settings. Although modeling is presented to the staff as a training technique which they can use to train clients, the use of modeling to train staff has been, at best, inconsistent and, at worst, overlooked. Previous practice in the classroom had been to provide a staff trainee with the option of seeing a model of the formal program or informal activity which he or she was about to perform. If the trainee felt the model would be beneficial, then it was provided, if not, then the trainee was required to perform the activity without the model and was scored on the appropriateness of his or her interactions with the client. Thus, it was left to the trainees to make subjective and uninformed decisions concerning the effectiveness of modeling on their own performance.

This study compares the effect of performance modeling with the effect of no modeling on formal, one-to-one program baseline scores.

## Method

The study took place in the Boulder Training Center (BTC) demonstration classroom. The subjects were 19 direct-care and support service staff, attending class across six weeks. Of the total 19 subjects, there were 11 direct-care cottage staff (Habilitation Aides I), 3 special education teachers, 2 habilitation training specialists, 1 social worker, 1 training officer, and 1 secretary.

The subjects were divided into two groups (Modeling and No Modeling) by randomly assigning three class weeks into the Modeling condition (n=9) and three class weeks into the No Modeling condition (n=10).

A pretest of 25 behavioral terms

administered at the beginning of each class indicated that, on the average, both groups had similar prior knowledge of training and of the classroom ($\bar{x}$ Modeling=31.8%, range 48%—100%; $\bar{x}$ No Modeling=78.6%, range 60%—100%).

## Procedure

The study was conducted as part of each trainee's baseline (first) formal program in the class. During both the Model and No Model conditions, the BTC instructors explained the student's clipboard and program information thoroughly. A checklist was used by the instructor during the explanation to insure that all components of the program were discussed with the trainee. For the trainees in the Model condition, the instructors then conducted two trials of the program with the client for the subject to observe. Trainees in the No Model condition received no such demonstration.

Following the explanation (and model, if scheduled), the trainee conducted five trials of the formal program while the instructor rated the delivery of cues and consequences and the recording of data. After the first five trials were completed (the program baseline), the instructor provided feedback concerning the trainee's performance during baseline. The trainee then completed any remaining trials in the program and, at the end, received additional feedback from the instructor.

Independent observers conducted reliability checks on both the completion of the checklist and scoring of the trainee's cues, consequences, and data recording. Reliability was conducted once in each condition; reliability was 100% on the checklist and observation form in both conditions.

## Results

The baseline scores from both groups for cues, consequences, and data recording were compiled. The trainees in the Model condition performed markedly better than the No Model trainees. The difference is most evident in the mean scores for cues and consequences between the groups. The Model group also scored higher than the No Model group in the accuracy of data recording, but the difference was not large. (See Table 1.) Table 2 presents individual subject scores.

| Group | CUES | CONSE-QUENCES | DATA RECORD |
|---|---|---|---|
| MODEL (n=9) | 84.4% | 80.2% | [redacted] |
| NO MODEL (n=10) | 54.0% | 56.0% | 76.0% |

Table 1. Mean scores for the conditions of Modeling and No Modeling

## Discussion

The use of modeling proved to have a substantial effect on teaching the trainees to use appropriate cues and consequences in formal programs. The mean score for cues was 30% higher in the Model group than in the No Model group, and the mean score for consequences was 24% higher. However, it appears that modeling had little effect on the ability to discern and accurately record program data, as the difference in mean scores was only 6%.

In the No Model group, five of the ten subjects achieved the 90% class criterion for one or more of the three scored items; in the Model group, eight of the nine subjects reached a criterion score. When the data recording score is discounted and only cues and consequences are examined, the differences between the groups are more pronounced: three of ten achieved criterion in the No Model condition; seven of nine reached a criterion score in the Model condition.

It seems clear that allowing the trainee to decide whether modeling would be of benefit to him or her is an invalid practice. The data clearly indicate that modeling is beneficial in teaching staff to conduct formal programs.

Directions for further research in this area include examining the effects of

| MODEL | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
|---|---|---|---|---|---|---|---|---|---|---|
| CUES | 60 | 100 | 80 | 60 | 100 | 100 | 100 | 60 | 100 | |
| CONSEQ | 80 | 80 | 80 | 100 | 20 | 100 | 100 | 100 | 60 | |
| DATA | 60 | 0 | 100 | 80 | 100 | 100 | 100 | 100 | 100 | |
| NO MODEL | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| CUES | 100 | 60 | 0 | 100 | 20 | 100 | 80 | 40 | 0 | 40 |
| CONSEQ | 100 | 80 | 60 | 60 | 0 | 60 | 60 | 40 | 80 | 20 |
| DATA | 100 | 0 | 60 | 60 | 100 | 100 | 80 | 80 | 80 | 100 |

Table 2. Individual subject program performance scores from the conditions of Modeling and No Modeling.

modeling on staff performance in other areas of client training and care. This study is limited in its scope to the conduct of formal training programs. In addition, the small number of subjects in this study restricts the extent of general conclusions that can be drawn.

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# DIABETIC DIET TRAINING FOR PRADER-WILLI INDIVIDUALS

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The Prader-Willi (PW) Syndrome was first described in 1956 (Prader, Labhart, Willi, & Franconi, 1956). It is now a well known disorder characterized by obesity, hypogonadism, hypotonia, and mental retardation. The etiology remains uncertain. A genetic cause has not been ruled out. Research has been in progress which indicates a high proportion of PW cases may be caused by a minute deletion of Chromosome 15 (Holm, Sulzbacher, & Pipes, 1981). The common characteristics of the syndrome are consistent with a defect in the hypothalmus (Pipes & Holm, 1973).

The syndrome has been reported in slightly more males than females. However, this is attributed to the fact that diagnosis is made easier by the early evidence of hypogonadism in the male.

The syndrome is characterized by an insatiable appetite leading to obesity. Intelligence quotients range from 20 to 90, with most ranging between 40 and 60 (Holms, Moser, Halldorsson, Mack, Pant, & Matzilevich, 1972).

In infancy there is marked hypotonia and inability to suck, often leading to failure to thrive and slow initial weight gain. However, by age one an excessive appetite is apparent, and by age two most of these individuals are clearly obese. Weight gain continues if caloric intake is not strictly monitored. By the time the teenage years are reached, these individuals are markedly overweight.

Their compulsion to constantly eat is presumed to result from a malfunction in the hypothalmic control of appetite (Holm, et al., 1981). They exhibit behavior consistent with constant hunger. This leads to inappropriate behaviors regarding food. They will steal, gourge, and eat garbage and unusual objects.

The tendancy to develop diabetes mellitus is not as common as first believed and appears to be related to the obesity. Hyperinsulinism has been reported (Para, Cervantes, & Shultz, 1973; Heald, 1969). It has been suggested that this may be due to some degree of peripheral resistance to the metabolic actions of insulin. Consequently, greater insulin production may be required in order to maintain normal levels of plasma glucose. Hypersensitivity to exogenous insulin also has been reported (Sareen, Ruvalcaba, & Kelley, 1975), as has resistance to exogenous insulin in some PW individuals with overt diabetes.

There is some evidence that PW individuals do not require as much carbohydrate as normal individuals, lest they begin to gain weight. Coplin, Hine, & Gormican (1976) reported a study in which they concluded that PW children require fewer calories than normal children to maintain their weight and require more drastic caloric reduction to lose weight.

Although a number of studies have been published regarding out-patient dietary training for PW individuals who live at home, a search of the literature has produced no published material concerning dietary training for individuals in residential facilities.

It is widely recognized that PW individuals must have close supervision to prevent overeating. However, this does not preclude the placement of those who are presently institutionalized into appropriate community facilities. It is to this end that a dietary training program has been developed for two institutionalized Prader-Willi individuals.

## Method

### Subjects

Subject A is a 32-year-old male who has been institutionalized since 1963. It was noted at birth that he was much weaker than his normal female twin, which suggests the presence of the initial hypotonia seen in PW syndrome. He remained at home until age 13, when he was admitted for institutional care. It was noted that his behavior was such that his parents could no longer control his food-related tantrums. He had

been dropped from public school in 1960 because of "behavior problems" associated with food.

Efforts at controlling his overeating remained futile. In 1976, after 13 years of institutionalization, his weight was 330 pounds. Some success was achieved between 1976 and 1979 through behavioral intervention, and his weight dropped, averaging between 270 and 290 pounds. However, by mid-1980 his weight was back up to 312 pounds. During this period, diabetes mellitus was diagnosed. Diabetes was suspected as early as February, 1979; however, glucose tolerance tests, blood glucose levels, and urine glucose remained normal until October, 1979, when overt diabetes was diagnosed. He was placed on a 1200 calorie diabetic diet and received NPH insulin 22 units daily.

Efforts to control his maladaptive food-related behavior continued through a series of behavior intervention programs (Plaska & Friman, 1978; Roeber & Plaska, 1981). In late 1980 he began to lose weight, and by early 1982 he was under 200 pounds.

By December 1981, his weight had dropped enough that the insulin doseage was decreased to 10 units daily. Further decrease in insulin was required, to 5 units daily in September, 1981, and was subsequently discontinued in November, 1982. He remains on a 1200 calorie diabetic diet.

He is 4 feet, 11 inches tall, currently weighs 162 pounds, and has a Full Scale I.Q. of 61. He reads at .75 first grade level; math skills are at .50 first grade level. He has good verbal skills and can write legibly. He is able to use a calculator and common household measuring tools. He has had no previous formal diet training, but has some understanding of food exchanges. He graduated from a urine testing program in 10 sessions in October, 1982. He is currently testing his own urine twice daily and recording the results.

Subject B is a 24-year-old female who has been institutionalized since June, 1982. She was born six weeks premature, weighing 3 pounds 9½ ounces at birth. Marked hypotonia and feeding problems were noted in infancy. Weight gain began to occur at about 18 months of age. She was diagnosed as mentally retarded at age 7, however, PW syndrome was not suspected until 1969 during the course of a genetic evaluation of a sibling. The diagnosis of PW syndrome was confirmed in 1978.

She lived at home until age 17. Temper tantrums relating to food prompted her parents to seek subsequent group home placement.

She lived in a group home from 1977 to 1982, when she left the group home to live on her own. The group home manager reported she would frequently steal food or steal money to buy food. From 1980 to early 1982 she worked in an Easter Seals program.

Diabetes mellitus was diagnosed in October, 1977, and she apparently required insulin for three months, after which she was given tablets. By March, 1982, having lived on her own for nearly two years, she had gained approximately 140 pounds. The diabetes worsened, and in a period of one year, her daily insulin requirements rose from 20 units to 140 units. Her diabetes was described as "insulin resistant."

Because of the severity of her obesity and diabetes, as well as other health problems, she was committed for institutional care and supervision in June, 1982, directly from a community hospital where she had been a patient for about one month.

Her weight was 267 pounds on admission to the institution, and she required 100 units of insulin daily. She was placed on a 1200 calorie diabetic diet. During the course of her initial medical evaluation, she was found to suffer from nocturnal oxygen desaturation due to the severe obesity. Two liters of oxygen during her sleeping hours were prescribed.

In seven months of supervised care, her weight has decreased to 205 pounds. Her insulin requirements have decreased; she currently receives 50 units daily. She

is able to give her own insulin injections. Supplemental oxygen continues at night.

A behavior intervention program involving point acquisition for adaptive behavior (self-help skills) and point loss for maladaptive behavior (tantrums, arguing, refusal to complete required programs) was initiated in October, 1982. She receives bonus points for weight loss and fines for weight gain. She has exhibited only one episode of tantrums since the program was initiated. No food stealing behavior has been witnessed since her admission.

She is 5 feet tall and has a Full Scale I.Q. of 71. She reads at the fourth grade level; math skills are at the fifth grade level. She has good verbal and writing skills. She is able to use a calculator and common household measuring tools. She has had some diet training by a community hospital dietitian and did her own cooking while living on her own. She was able to prepare fairly balanced meals, but was unable to control the portions. A baseline to determine her ability to test her own urine samples has not been conducted.

Procedure

The long range goals of this program are to provide each subject with the necessary skills to assist in the planning of their meals by using the diabetic diet substitution (exchange) list to prepare meals and snacks under supervision.

In order to meet the long range goals, seven objectives have been written into the program. These objectives, in order of progression, are (1) identifying the six food groups in the diabetic diet substitution list, (2) identifying the foods necessary to maintain a balanced diet using the diabetic diet substitution list, (3) calculating the number of calories allowed for each meal and each snack using a calculator, (4) planning menus for breakfast, lunch, dinner, and snacks using the diabetic diet substitution list, (5) planning special meals and snacks, e.g., holidays and birthdays, using the diabetic diet substitution list, (6) ordering meals at restaurants within diet limitations, and (7) preparing special meals under the supervision of the dietition and/or staff.

Basic skills needed to complete the program include verbal communication, some reading and writing ability, use of a calculator, and use of household measuring tools.

The program is not designed to allow total independent diet planning and food preparation. There is general agreement that PW individuals must be supervised to control obesity and related health problems because they lack the ability to control themselves.

The subjects are currently receiving instruction together in an informal classroom setting in the Staff Development Department. There is one instructor managing the program. Provisions have been made for the program to be carried out by other department staff when needed. The dietitian is providing assistance as needed. Concurrent training in basic skills is being provided by the Education Department.

The subjects have completed 10 weeks of a preparatory class, developing their own food scrapbooks. During this time, they cut out pictures of various foods from magazines, pasted them in their scrapbooks according to food groups, and labeled each with the number of calories per serving. This has aided them in identifying various foods and food groups, as well reinforced their need to be aware of calories. It has aided in maintaining reading and writing skills already developed. They are learning to share and socialize.

Seven task-analyzed programs are being developed to meet the objectives. The first formal program was started in December, 1982. Subject A is progressing through the first formal program. He is now able to independently read and write two of the six food groups. Subject B graduated from the first formal program and is able to independently read and write the six food groups. Data on each subject are being collected and analyzed to determine the success of the entire program.

(Note: The author would appreciate any unpublished information or studies which are pertinent to the

above-described program. Please send to Barbara Sutherlin, Staff Development Department, Boulder River School and Hospital, Post Office Box 87, Boulder, MT 59632.)

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## A FUNCTIONAL DATA SHEET


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Education Department


The idea of a functional data sheet had its basis in two skill acquisition programs assigned to me. The clients in these programs were making no progress, according to the data compiled in basic data sheets. However, I felt the basic data sheet to be lacking in some functional areas.

1) The basic data sheet, set up to record trial-by-trial data and to compute the percentage of correct (independent) responses each session, is not sensitive to reflecting small increments of behavior changes.

2) Graphing the data from the basic data sheet requires an additional page for each program.

Given these shortcomings, I changed my data collection system to reflect what I felt were important areas in the assessment of client progress.

### The Functional Data Sheet

The functional data sheet is divided into three parts. The bottom third is designed for recording trial-by-trial data, using the slash (/) and circle (0) system to indicate incorrect and correct responses, respectively. A "correct" response is defined as one which the client completes independent of any prompt except an initial, verbal cue. The middle third of the form provides space to graph the average level

of graduated guidance required during each session. The top third is a graph for monitoring the percentage of correct responses for each session.

As the trainer marks each trial incorrect or correct, a number indicating the level of assistance is also marked for the trial. The numbers used to indicate levels of assistance are as follows:

5—independent response
4—verbal prompt
3—gestural prompt
2—partial physical prompt
1—full physical prompt

After all trials are completed, the assistance numbers are summed and divided by the number of trials, resulting in an average of assistance for that session.

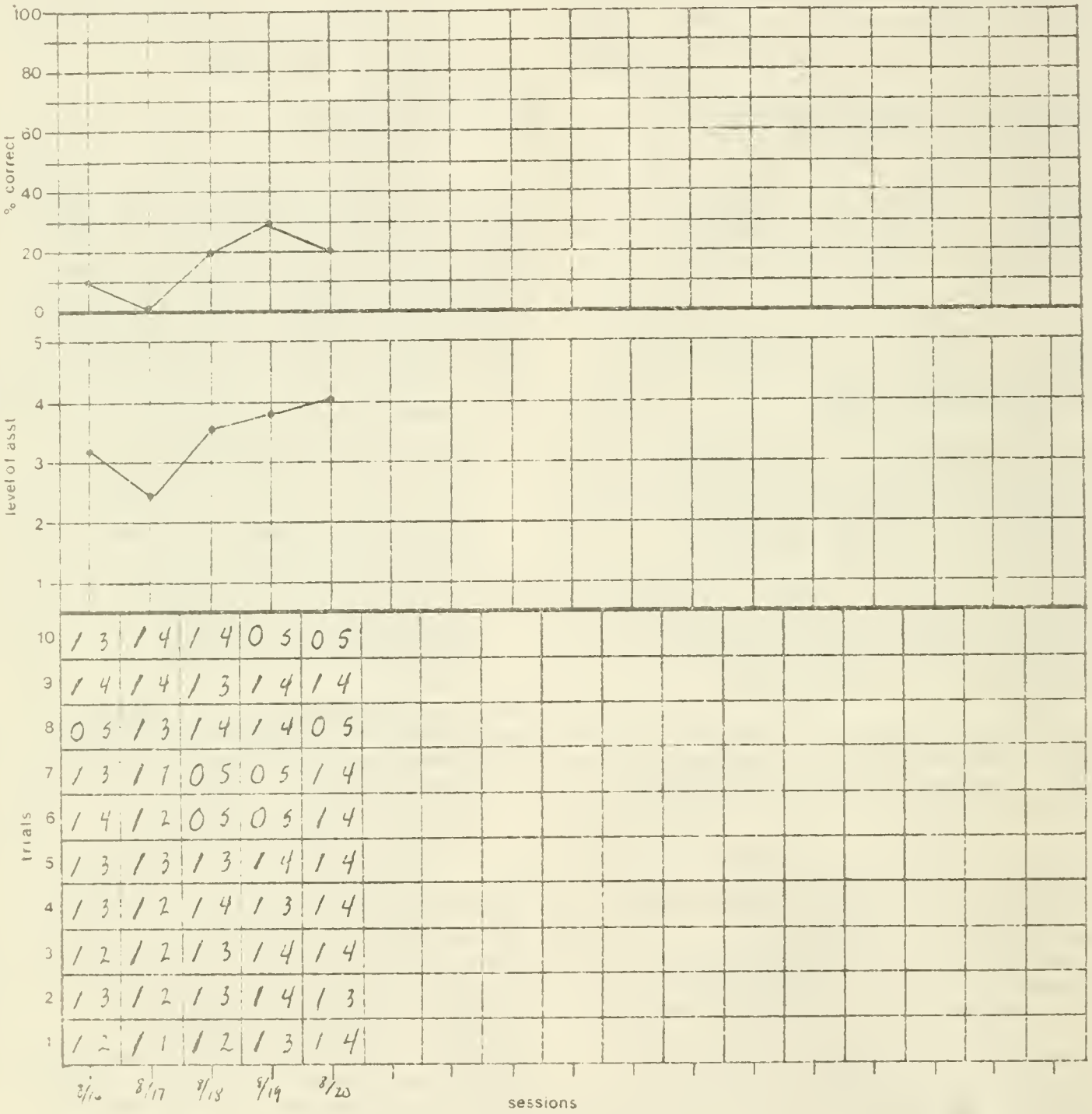


Figure 1. A facsimile of the data sheet with five sessions' data charted.

The average is then graphed in the space provided for level of assistance in the middle of the page. Above that, the trainer graphs the percentage of independent responses for the session. (See Figure 1.)

Summary and Conclusions

There are many advantages that I've seen in using the functional data sheet.

1) Trial-by-trial monitoring of graduated guidance levels gives the trainer additional information about patterns of learning or skill acquisition.
2) Computing an average level of assistance enables the trainer to see progress, even on slowly progressing clients.
3) The system includes trial-by-trial data and provides a graph for tracking the traditional percentage of correct responses for each session.

Benefits to the trainer in using this data sheet include the following:

1) the convenience of daily graphing as the data are gathered,
2) the convenience of having all the relevant data on one page,
3) more accurate and informative monthly updates that are easier to compile, given the range of available data (particularly for slowly progressing clients), and
4) increased accountability of training time through the demonstration of small increments of behavior change, as reflected by the average daily level of assistance.

*One fact is a* datum, *'tis true;*
*To use* data, *you need at least two.*
*Yet one often sees*
*That "the data agrees" --*
*Beware this grammatical* snafu.

# A REPLICATION OF THE BOULDER TRAINING MODEL

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Della Jarrett
Eastern Montana Industries

Eastern Montana Industries (EMI), a nonprofit vocational training facility in Miles City, Montana, has replicated the Boulder Training Model (BTM) as a staff and client training method. This project began in January, 1982, with the training of two EMI staff at Boulder in the Boulder Training Center. A three-month development phase ended in late March with the in-house training of the two remaining Training Center staff.

EMI converted the Intensive Training Unit, which had served as prevocational skills, functional academics, and assessment center, to the Training Center, employing the BTM as the training system. The Training Center is similar to the Intensive Training Unit in that clients still receive training in prevocational skills at a higher staff-to-client ratio than in the main shop. When the clients reach a criterion level of vocational performance, they graduate gradually into the main shop. The Training Center includes the function of training all present and new staff. Since the same instructors who train clients are now responsible for training employees when a group cycles through, there has been little staff cost to the project. When staff are being trained, the Training Center instructors receive a higher rate of pay than they normally would. During the development phase, there was a short downturn in the number of programs performed with clients while the staff organized the center.

All Level I objectives of the BTM are employed except the behavior intervention program comprehension objective. No Level II objectives are presently employed, but there are plans to eventually add them. Lectures have been changed somewhat to allow for the differences between Department of Institutions and Department of Social

and Rehabilitation Services policies. The BTM manual is used, and staff are alerted to differences in policies.

Thus far 20 EMI employees have been trained, and 13 remain to be trained. All trainees have been direct-care staff, 11 from group homes and nine from the shop (adult vocational training). Of the 13 remaining to be trained, two are support staff, three are Work Adjustment employees, one is a semi-independent living trainer, and seven are direct training staff.

The greatest general change noticable thus far is a dramatic improvement in the organization of the training effort in the areas affected, especially the Training Center. The increased organization has allowed Training Center staff to increase the numbers of client programs implemented, even though staff responsibilities have increased. Instead of specific trainers being responsible for specific client programs, there is now more interchangability, so that when a trainer is absent, a specific group of clients no longer faces a lack of programming. Trainers tend to rotate their attention more effectively among clients, and cues and consequences are more accurate. Cues are given more often and followed by consequences more often. These conclusions are supported by baseline and posttraining data on shop trainers.

## NOTES FROM THE BTC

It has been three years since any news of the Boulder Training Center (BTC) appeared in these pages. They have not, however, been three years of BTC inactivity. In addition to its ongoing training of employees and clients in the demonstration classroom, the BTC has expanded its training to include short inservice sessions to direct-care staff.

The BTC has also completed a number of projects. In early 1981, the training center worked with the staff of a nonambulatory ward supervised by Ada Hanson, former BTC instructor, to develop a staff orientation program. Designed to impart the skills needed for the specialized care of nonambulatory clients, the program includes an extensive system for assessing the maintenance of those skills. At present, work is underway to examine the program after its first two years and to make minor revisions.

Over the past three years, BTC staff have also designed and conducted nine applied research projects, examining questions related to staff training as well as client treatment. Among the topics of research have been the rate of rotation of trainer attention among clients in group training, the effects of different types of music on the stereotypic behavior of clients, and a comparison between graduated guidance and a one-prompt procedure in correcting client errors in programs. In addition, research was undertaken to compare primary and social reinforcement to social reinforcement alone in formal training sessions, to compare the accuracy of different methods of time-sample measurement, and to assess the effect of modeling in staff training (reported in this issue).

Veteran instructor John Zeeck has just taken over the helm of the BTC, succeeding Linda Poniktera. Mary Cameron and Steven Singleton have joined the department within the last seven months, and recruiting is underway for another instructor.

## CONFERENCE ANNOUNCEMENT

The Institute for Habilitative Services at Eastern Montana College has announced the convening of the 1983 Montana Conference on the Severely Handicapped and Autistic. Dates of the conference are March 10 through 12, 1983, at the Sheraton Hotel in Billings Montana.

The theme of the conference this year is "Learning from Others." Among those from whom conference attendees will have the opportunity to learn are John Opitz, MD, and Paul Wehman, PhD. Dr. Opitz, coordinator of the Shodair Hospital Genetics and Birth Defects Unit, is a noted expert

on genetics and handicapping conditions. Dr. Wehman, an associate professor at Virginia Commonwealth University, is known for his work in vocational training for severely handicapped persons. In addition to presentations by the keynote speakers, several participants from the state and region will present papers on new teaching methods, residential alternatives, and research on the severely handicapped and autistic, among other topics.

The conference is sponsored by the Institute for Habilitative Services, Eastern Montana College, the Montana Society for Autistic Children, and the Montana Office of Public Instruction. Continuing education credit for attending the conference will be available through Eastern Montana College. The preregistration fee is $25.00; on-site registration will be $30.00. Hotel reservations should be made by February 23, 1983. Further information on the conference is available from the Institute for Habilitative Services, Eastern Montana College, Billings, MT 59101 (attn: Sev Hand/ Aut Conf).

## POSITIONS AVAILABLE

COTTAGE SUPERVISOR. Responsible for supervising the overall operation of a residential unit for developmentally disabled individuals. Duties include the selection, supervision, and evaluation of staff, participation in the development of individual habilitation plans and supervision of their implementation. Requirements include an M.A. in Psychology or Special Education, knowledge of behavioral principles and management, organization and supervisory skills. Applicants with relevant experience preferred. Annual salary: $20,005.

HABILITATION TRAINING SPECIALIST. Bachelor's degree in Psychology or Special Education required; applicants with experience developing skill training and behavior management programs for developmentally disabled individuals preferred. Must be knowledgeable of behavioral principles, legal and ethical guidelines, and data collection/evaluation procedures. Must be able to develop habilitative training programs, provide inservice training to staff, collect and analyze data to evaluate program effectiveness. Annual salary: $17,119.

REGISTERED NURSE. Part-time and/or full-time positions. Starting salaries (full-time) range from $20,542-$22,347 annually. Graduates of two-, three-, or four-year accredited RN programs considered.

RECREATION THERAPIST. Plans and implements a variety of recreational activities, supervises staff. Tests and evaluates clients, participates in development of IHPs. Requirements include Master's degree in Recreation Therapy and completion of internship plus one year of experience. Water Safety Instruction certification required. Starting salary is $20,055 annually.

STAFF PHYSICAL THERAPIST. Starting salary: $22,347 annually.

Assists supervisor in planning and directing therapy programs, provides services to developmentally disabled clients. B.A. degree in Physical Therapy is required.

*Please direct inquiries concerning the above positions to:* Personnel Office, Boulder River School and Hospital, Post Office Box 87, Boulder, MT 59632. Phone: (406) 225-3311, ext. 284. *Equal opportunity employer.*

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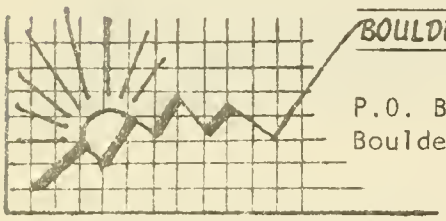

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